Chapter 19
AIR MONITORING SYSTEM

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DESCRIPTION

Introduction

1. The air monitoring system is an installation used for the detection and collection of radio-active material from the upper atmosphere. Provision is also made for the collection of cabin air samples.

Detection

2. The presence of radio-active material in the atmosphere is sensed by four detector units fitted in the cockpit and relayed to control units at the A.E.O's position.

Sample collection

Mk.3 sampling ducts

3. A pod, comprising a modified fuel tank with an extended nose cone assembly, is mounted on a pylon underneath the port and starboard main planes. Each nose assembly houses Mk.3 sampling ducts which are the main debris collectors. The ducts each consist of eight tetrahedral baskets lined with filter material. At the indicated presence of radio-active material a linear actuator, controlled from the A.E.O's position, opens the ducts and allows debris to collect in the filter baskets.

Sample monitoring

Mk.10 filter monitoring duct

4. This unit is fitted underneath the port main plane and consists of an open-ended cylindrical filter on which debris accumulates. Its purpose is to measure the activity and density of the debris in the atmosphere around the aircraft.

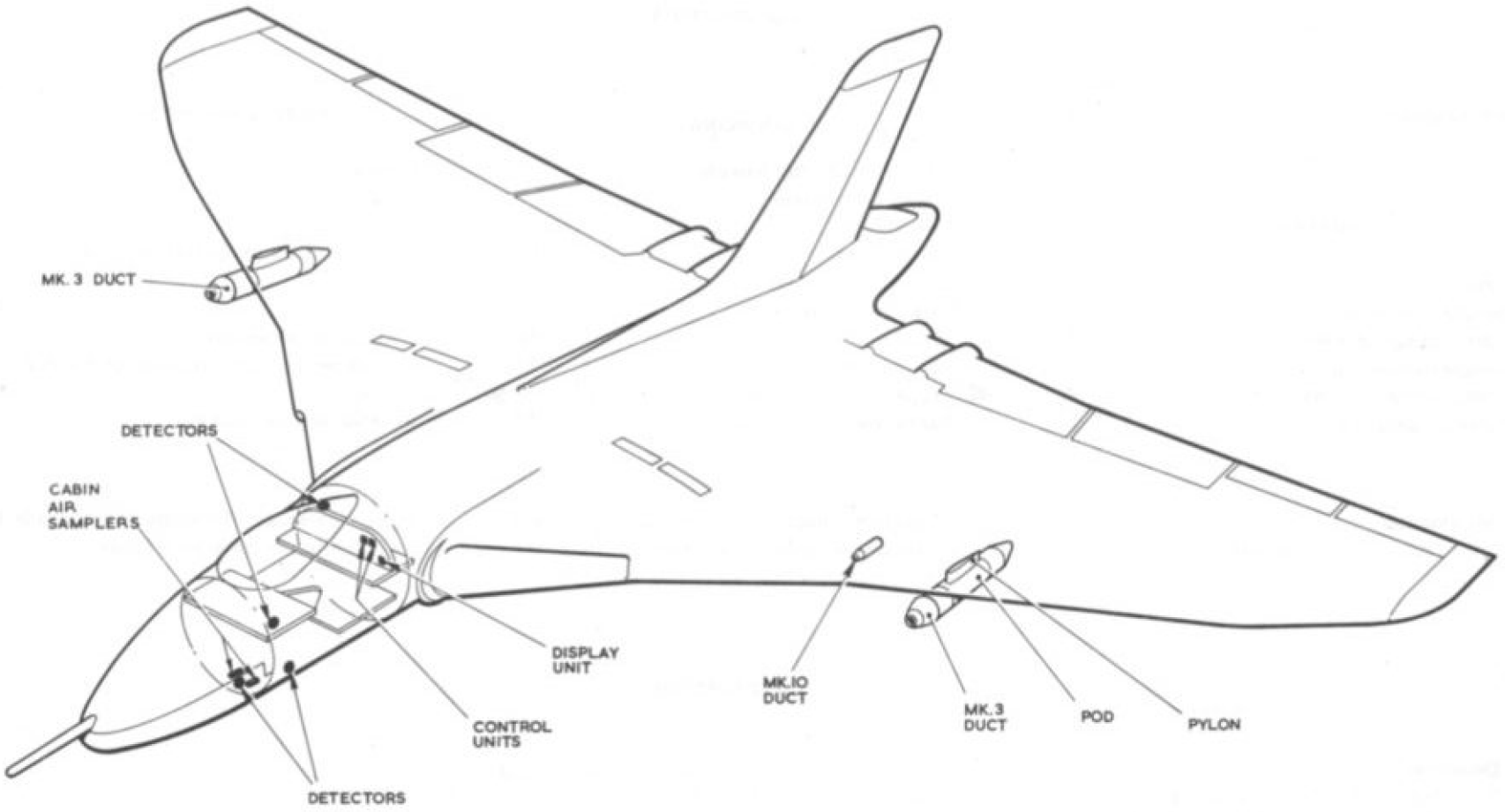

Fig.1 Location of equipment

◄ *Units re-fitted* ►

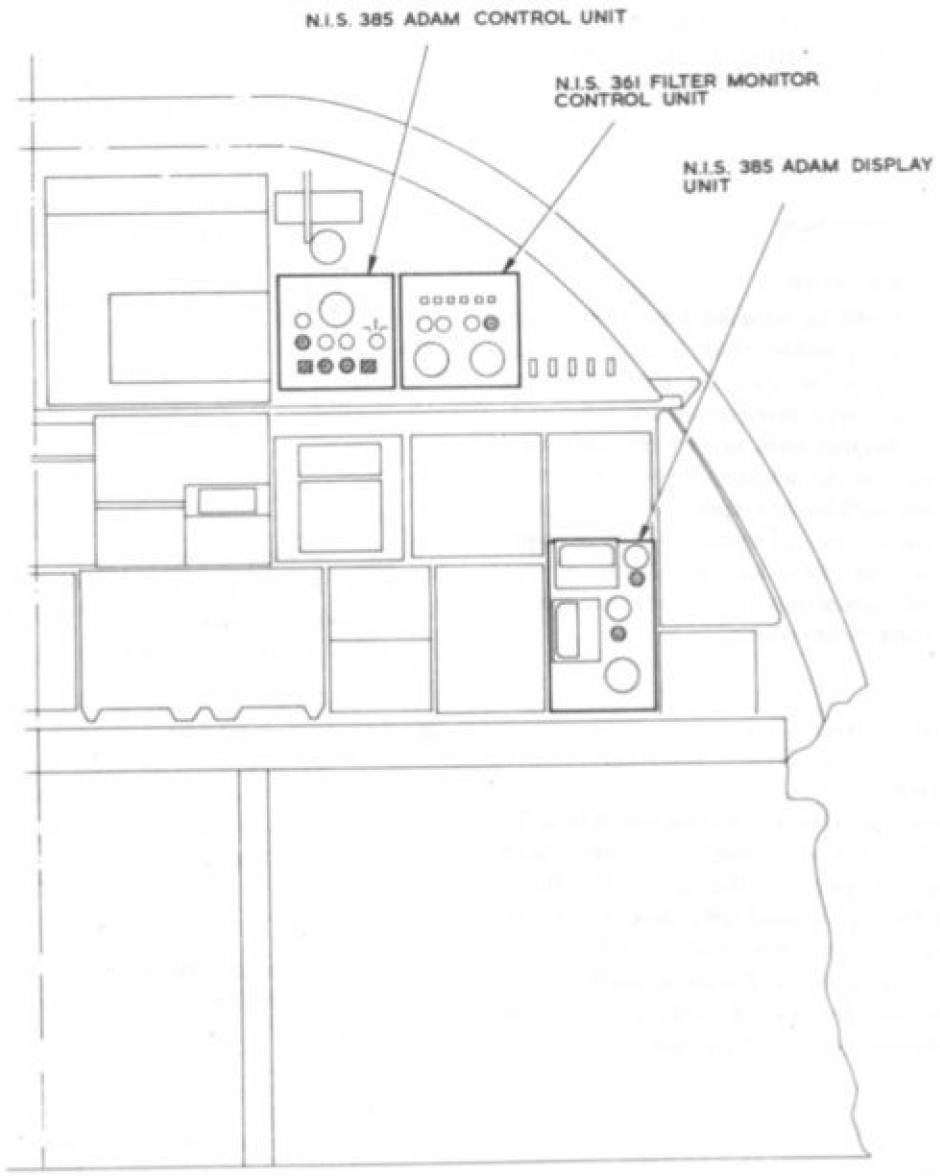

Fig.2 Arrangement of control panels at A.E.O.'s position

Cabin air sampling

5. Two air sampler units located on the bomb sight cover, are used to sample any airborne contamination within the cockpit. These samplers are carried for health purposes only.

SERVICING

Preparation of filter baskets

6. Scrupulous care must be taken to ensure that both the baskets and filters are clean. The work of preparing filter baskets must be carried out in a specially prepared clean area and the handler must wear washed surgical gloves (even new gloves must first be washed and dried to remove all traces of protective powder). After a basket has been fitted with a filter paper it must be placed in a polythene bag and protected from damage until it is installed in the aircraft.

Aircraft preparation

Mk.3 ducts

7. Before fitment of clean filter baskets the interior of the Mk.3 ducts are to be inspected for cleanliness and cleaned as necessary. This necessitates the removal of each nose cone intake, held in position by twenty-four 2 B.A. mushroom-headed bolts. The intake must be cleaned thoroughly inside and outside before being refitted to the pod.

8. Immediately before an operation the Mk.3 ducts are to be fully loaded with clean prepared filter baskets as follows:-

(1) Ensure a d.c. power supply is available on the aircraft.

(2) Select appropriate duct switch, located at the A.E.O's position, to OPEN and when duct is partially open return switch to centre position.

(3) Remove rubber cap from actuator domed bung. Remove the four bolts and associated washers securing bung to actuator piston and stow bung temporarily in the duct intake.

(4) Select duct switch to OPEN to fully withdraw actuator piston.

(5) Fit clean prepared filter baskets into each recess and lock firmly into position with the spring-loaded wing nuts.

(6) Select duct switch to SHUT and when duct is partially closed return switch to centre position.

(7) Secure domed bung to actuator piston and fit rubber cap to bung.

(8) Select duct switch to SHUT and when indicator shows BLACK, return switch to centre position.

(9) Cover the complete duct with a polythene bag and seal to the pod with tape. Remove just before take-off.

(10) Carry out the above procedure on opposite side pod.

Mk.10 duct

9. Loading the Mk.10 duct with a Mk.9 filter is a simple procedure of removing the four retaining screws from the forward section of the duct, sliding the cover off, fitting a new filter element, replacing the duct cover and securing it in position with the four retaining screws.

Post-sortie procedures

SAFETY WARNING . . .

Samples should be removed from the aircraft as soon as possible after landing. Careful attention to detail must be paid to ensure health and safety precautions are fully met. There are hazards from aircraft contamination as well as from the samples, but with the use of protective clothing and special handling tools contamination can be contained. The principle must be the maximum protection of the individual commensurate with the completion of the operational task.

Removal of filters

CAUTION . . .

Care must be taken when removing filters. Do not allow them to come into contact with unprotected parts of the body. The filters should be kept scrupulously clean and not be allowed to come into contact with greasy, dirty or wet surfaces. The work will be carried out by specially trained, attached personnel, immediately the aircraft has come to rest.

Mk.3 ducts

10. Wearing protective gloves, remove the filter baskets as follows:-

(1) Proceed as in para.8 operations (1), (2), (3) and (4).

(2) Using the special filter handling tool remove each basket in turn from its duct starting with the basket in the one o'clock position. As each basket is removed it is to be placed in a polythene bag pre-marked with the basket identification number, i.e. P1 to P8 or S1 to S8 as appropriate.

(3) Continue as in para.8 operations (6), (7) and (8).

(4) Carry out the above procedure on opposite side pod.

Mk.10 duct

11. Wearing protective gloves remove the Mk.9 filter from the duct by reversing the procedure detailed in para.9. Place the filter in the special container provided.

◀ *Type SC1 air sampler*

12. Wearing protective gloves remove the filter from the left-hand air sampler mounted on the bomb sight cover. Place filter in a labelled polythene bag. ▶

Post-removal procedures

13. On completion of the above removal sequences:-

(1) Remove all baskets/filters to sample room for assessment.

(2) Remove protective gloves and dispose of them as radio-active waste.

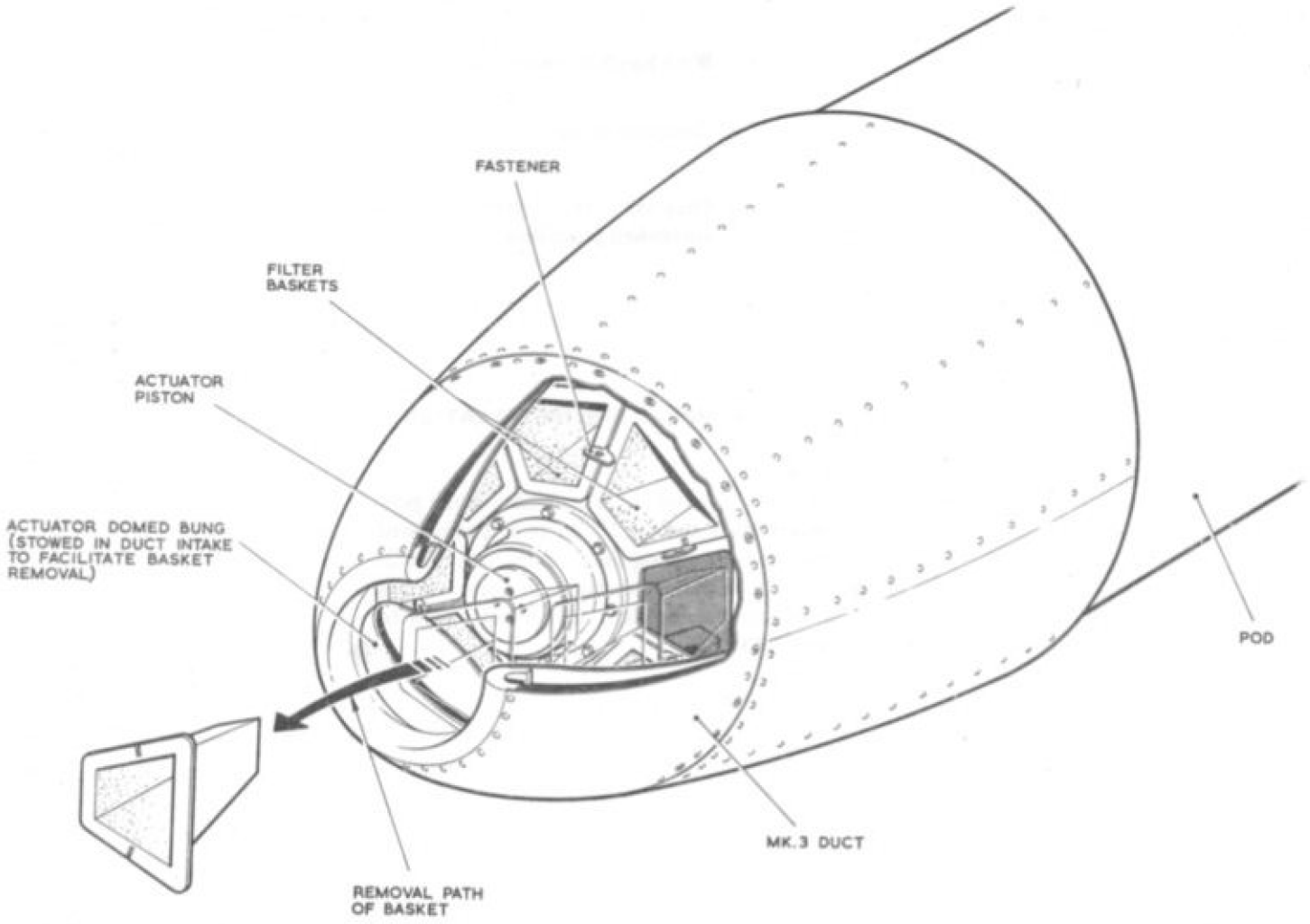

Fig. 3 Removal of filter baskets

(3) Wash hands in running water.

(4) Complete necessary documentation.

(5) Dispose of filters following authorised procedure.

REMOVAL AND INSTALLATION

General

14. For removal and installation of the pod, pylon, Mk.3 and Mk.10 ducts and associated cockpit-fitted equipment refer to Sect.2, Chap.5B of this Publication. For removal and installation of the Mk.3 duct actuator refer to Sect.7, Chap.9.